REMARKS

This Amendment, submitted in response to the Office Action dated September 20, 2002, is believed to be fully responsive to each point of rejection raised therein. Accordingly, favorable reconsideration on the merits is respectfully requested.

As a preliminary matter, claims 3, 5, 9 and 11 are objected to for containing informalities. Appropriate corrections are set forth above to obviate these objections.

Turning to the merits of the Office Action, claims 1-17 have been rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter not supported by the specification. Claims 1-12 have been rejected under 35 U.S.C. § 112, second paragraph, for being indefinite. Claims 1, 2, 7 and 8 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Bridges (U.S.P. 6,075,549). Applicant has also verified with the Examiner that claims 3-6 and 9-17 describe subject matter which is allowable over the art of record, but are presently rejected based on Section 112. Claim amendments for obviating the Section 112, second paragraph, rejections are set forth above. The modifications do not narrow the scope of the claims. Applicant further submits the following comments in traversal of the Section 112 and prior art rejections.

Applicant's invention relates to an apparatus and a method for providing scan control that does not require high precision machining in order to maintain a highly accurate exposure with the apparatus. This is achieved by accounting for any deviations in distance caused by movements of the scanning apparatus. Referring to Fig. 3, for example, an exposure head 92 emits light towards a printing plate 12 wound onto a rotating drum 54. A sub-scanning mechanism 102 moves the exposure head 92 in a sub-scanning direction which is the direction perpendicular to the plane of Fig. 3. A feed screw 156 disposed between a pair of guide rails 152

to move the exposure head along the axial direction of the rotating drum (e.g. a sub-scanning direction). Page 26, first full paragraph. A driving shaft (Fig. 4, element 160A) of a driving motor (Fig. 4, element 160) rotates the feed screw to impart scanning. As shown in Fig. 3, the exposure head is mounted on a base plate 104 provided with a distance adjusting mechanism 94. Page 27, first full paragraph. The distance adjuster, having a turning screw and associated drive mechanism 110 adjusts the distance between the exposure head and drum. Referring to Fig. 5, a memory 178 stores distance correction information to activate the moving mechanism 110. Page 30 of the specification describes an exemplary method for determining the distance correction information. In particular, the distance (z) between the exposure head 92 and a rotating drum 54, and the deviation in position at which the printing plate 12 is irradiated by a light beam in the main scan direction (rotation direction y) are measured as the exposure head moves a step (e.g. corresponding to one rotation) in the sub-scan direction. The measured values for Δz and Δy helps set correction information. It is further noted that the distance Δy depends on the deviation of a position of a light beam relative to a preset standard position during step movement of the light beam. The methodology for determining the distance can be through various methods. The measurements for obtaining corrective data can be performed manually or by any known measurement technique which would be commonly known to one skilled in the art.

With regard to the Section 112, first paragraph rejection, the Examiner's primary objection relates to how the distance is measured between the recording medium and the light source while the light source is being moved by the light scanning apparatus. As discussed above, the specification clearly shows that the measurement is being taken at each step of a scan mechanism. The precise nature of how that measurement is done whether manually or by

alternative means is readily apparent to one skilled in the art. For example, in the Examiner's own rejection based on Bridges, the Examiner contends that the measurement is necessarily enabled by the Bridges patent based on a brief reference of relative distance between two structure arms of an adjusting device. The distance between the light source and the medium is not directly discussed. The present specification is much more explicit in supporting that a measurement is being taken while the light source, mounted on an exposure head, is moved during scanning. By contrast, in Bridges, the Examiner must rely on inherency principles based on necessity to show that the measurement aspect is taught in Bridges. Therefore, the specification at pages 29-31, for example, expressly and adequately supports and discloses this feature of the claim regarding measurements taken during scanning.

To the extent that the Examiner contends that pages 30-31 does not meet the requirements of Section 112, first paragraph for claims 1-17, Applicant would submit that the Examiner's reliance on col. 2, lines 26-29 of Bridges to teach the same feature is equally deficient such that the cited portions cannot support an anticipation rejection.

Therefore, if the Examiner maintains that Section 112 rejection, then the even more sketchy description at col. 2 of Bridges also does not adequately teach the recited claim feature. However, unlike Bridges, Applicant's specification does affirmative teach the taking and logging of measurements (see Figs. 6A-6B). For this reason, the Section 112, first paragraph rejection, should be withdrawn.

Turning to the teachings of the cited art, Bridges relates to a lens adjustment structure that is able to make fine adjustments to account for variations in a thickness of a material being

scanned by a light. See col. 1, lines 38-59. Significantly, the reference describes a lens adjustment that can be focused on a predictable media surface, suggesting a stationary correction. Referring to Fig. 4, the lens adjustment device 100 includes three arms 102-104 connected to top and bottom links 106, 108 by narrow webs 110. Vertical movement of arm 104 relative to arm 102 by a given distance will cause the central arm 103 (on which the light is mounted) to move a distance which is half of the distance that the arm 104 was moved. During assembly, the adjustment block 100 is attached to rotor 32 by a screw 116. The lens assembly (31) can be focused by merely turning the lens adjustment screw 118 to raise or lower arm 104 relative to the rotor 32. The central arm 103 follows arm 104 moving one half of the distance of arm 104 to provide fine adjustments during assembly. Col. 4, lines 36-61. Significantly, the adjustment screw 118 which causes movement in the arm 104 is not connected to any motor or other mechanism that would permit movements during scanning.

The Examiner maintains that Bridges teaches each feature of independent claim 1. Applicant would submit that the rejection is not supported for at least the following reasons.

First, contrary to the Examiner's contention, Bridges does not teach distance correction processing during a scan exposing of the recording medium, where the light source is moved toward and away from the recording medium synchronously with movement of the light source. As an example, Bridges does not teach a correction with respect to the exposure head and rotating drum holding a medium. Rather, in Bridges any adjustment is made at the time of assembly, in which case no scanning of a medium is occurring. Similarly, any field adjustments are made prior to a scanning, such as to accommodate materials of different thickness. Thus, while claim 1 describes distance correction during scanning, with synchronous movement

between the light source and the scanning device, Bridges does not include distance corrections during scanning in such a synchronous manner. In this connection, it is further noted that the adjusting screw 118 in Bridges is not connected to any moving mechanism that would permit adjustment during scanning, and therefore also cannot be synchronized with any scanning mechanism. Therefore, claim 1 is patentable for at least this reason.

Second, the Examiner's reliance on the claim language at col. 5, line 63 to col. 6, line 15, does not support the rejection. The cited portion merely indicates a means for adjusting a position of the light relative to the medium and the structure of the adjustment device. The cited portion does not indicate that the adjustment is performed during scanning or synchronously with any scanning device.

Third, contrary to the Examiner's suggestion, Bridges does not describe measuring distance between a recording medium and a light source while the light source is being moved by a light source scanning apparatus. The Examiner relies on inherency to teach the measurement between the medium and light, stating that measuring distance is necessary to effectively move the light source by a predetermined distance. The Examiner relies on col. 2, lines 26-29 to support this contention. The Examiner's conclusion is incorrect. Col. 2, lines 26-29 merely indicates that the movement of a central arm is half that of a peripheral arm of the adjustment device. At best, this measurement provides relative movements of the arms, but not the distance to the light source as claimed. Moreover, the adjustment need not be based on a measurement between the light source and medium at all. Rather, the adjustment can be based on a known focal length of the lens and a thickness of the material. Finally, the measurement does not occur while the light source is being moved. It is clear that there are many deficiencies in the

Examiner's rationale in the anticipation rejection. Therefore, claim 1 is patentable for the foregoing reasons. Claim 2 is patentable based on its dependency.

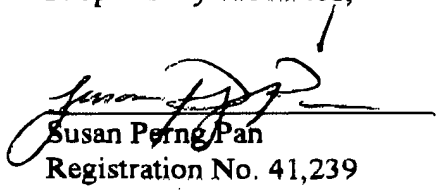
Because independent claim 7 includes features similar to that set forth above for claim 1, claim 7 is also patentable for the reasons set forth above. Claim 8 is patentable based on its dependency.

Applicant adds claims 18 and 19, corresponding to allowable claims 3 and 9 but with a reduced set of claim requirements, to provide an alternative scope of coverage for the invention.

In view of the above, Applicant submits that claims 1-19 are in condition for allowance. Therefore it is respectfully requested that the subject application be passed to issue at the earliest possible time. The Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

The claims are amended as follows:

1 (Amended) A method for controlling exposure, wherein a recording medium is irradiated with a light beam emitted from a light source which is moved along one of main scanning and sub-scanning directions by a light source scanning apparatus, the recording medium being moved along the other of the main scanning and the sub-scanning directions, to scan-expose the recording medium, the method comprising:

obtaining distance correction data which is generated by measuring distance between the recording medium and the light source while the light source is being moved by the light source scanning apparatus; and

[a] performing distance correction processing, in which during scan-exposing of the recording medium, the light source is moved toward and away from the recording medium synchronously with the movement of the light source by the light source scanning apparatus based on the distance correction data. [, on the basis of distance correction data which is generated by measuring distance between the recording medium and the light source while the light source is being moved by the light source scanning apparatus.]

2 (Amended). The method for controlling exposure of claim 1, the method further comprising:

obtaining light-emission correction data which is generated by measuring a position irradiated with the light beam emitted from the light source onto the recording medium while the light source is being moved by the light source scanning apparatus; and

[a] performing light-emission correction processing, wherein, during scan-exposing of the recording medium, light-emission of the light source is controlled synchronously with the movement of the light source by the light source scanning apparatus based on the light-emission correction data. [,on the basis of light-emission correction data which is generated by measuring a position irradiated with the light beam emitted from the light source onto the recording medium while the light source is being moved by the light source scanning apparatus.]

3 (Amended). The method for controlling exposure of claim 1, wherein the distance correction processing comprises the steps of:

a) initiating movement of the light source by the light source scanning apparatus;

b) reading the distance correction data for one step immediately before exposure, the one step being a predetermined amount by which the light source is moved for exposure by the light source scanning apparatus;

c) identifying that the light source has reached a distance at which the movement for exposure for the one step is initiated;

d) carrying out the movement for exposure for the one step of the light source by the light source scanning apparatus, and repeating the steps b), c) and d); and

e) returning the light source to the position where the scan-[expose] exposure initiated, when the light source has reached a position at which the exposure of the recording medium is completed.

5 (Amended). The method for controlling exposure of claim 2, wherein the light-emission correction processing comprises the steps of:

a) initiating movement of the light source by the light source scanning apparatus;

b) reading the light-emission correction data for one step immediately before exposure, the one step being a predetermined amount by which the light source is moved for exposure by the light source scanning apparatus;

c) setting light-emission initiating timing on the basis of the light-emission correction data which has been read;

d) identifying that the light source has reached a position at which the movement for exposure for the one step is initiated;

e) carrying out the light-emission of the light source at the light-emission initiating timing which has been set, and repeating the steps b), c), d) and e); and

f) returning the light source to the position at which the scan-[expose] exposure initiated, when the light source has reached a position at which the exposure for the recording medium is completed.

7 (Amended). A method for controlling exposure, wherein a recording medium is irradiated with a light beam emitted from a light source which is moved along one of main scanning and sub-scanning directions by a light source scanning apparatus, the recording medium being moved along the other of the main scanning and the sub-scanning directions, to scan-expose the recording medium, the method comprising:

obtaining light-emission correction data which is generated by measuring a position irradiated with the light beam emitted from the light source onto the recording medium while the light source is being moved by the light source scanning apparatus; and

performing light-emission correction processing, wherein, during scan-exposing of the recording medium, light-emission of the light source is controlled synchronously with the movement of the light source by the light source scanning apparatus based on the light-emission correction data. [, on the basis of light-emission correction data which is generated by measuring a position irradiated with the light beam emitted from the light source onto the recording medium while the light source is being moved by the light source scanning apparatus.]

8 (Amended). The method for controlling exposure of claim 7, the method further comprising:

obtaining distance correction data which is generated by measuring distance between the recording medium and the light source while the light source is being moved by the light source scanning apparatus; and

performing distance correction processing, wherein, during scan-exposing of the recording medium, the light source is moved toward and away from the recording medium synchronously with the movement of the light source by the light source scanning apparatus based on the distance correction data. [, on the basis of distance correction data which is generated by measuring distance between the recording medium and the light source while the light source is being moved by the light source scanning apparatus.]

9 (Amended). The method for controlling exposure of claim 7, wherein the light-emission correction processing comprises the steps of:

a) initiating movement of the light source by the light source scanning apparatus;

b) reading the light-emission correction data for one step immediately before exposure, the one step being a predetermined amount by which the light source is moved for exposure by the light source scanning apparatus;

c) setting light-emission initiating timing on the basis of the light-emission correction data which has been read;

d) identifying that the light source has reached a position at which the movement for exposure for the one step is initiated;

e) carrying out the light-emission of the light source at the light-emission initiating timing which has been set, and repeating the steps b), c), d) and e); and

f) returning the light source to the position at which the scan-[expose] exposure initiated, when the light source has reached a position at which the exposure for the recording medium is completed.

11 (Amended). The method for controlling exposure of claim 4, wherein the distance correction processing comprises the steps of:

a) initiating movement of the light source by the light source scanning apparatus;

b) reading the distance correction data for one step immediately before exposure, the one step being a predetermined amount by which the light source is moved for exposure by the light source scanning apparatus;

c) identifying that the light source has reached a distance at which the movement for exposure for the one step is initiated;

d) carrying out the movement for exposure for the one step of the light source by the light source scanning apparatus, and repeating the steps b), c) and d); and

e) returning the light source to the position where the scan-[expose] exposure initiated, when the light source has reached a position at which the exposure of the recording medium is completed.

Claims 18 and 19 are added as new claims.